

The

Wellness Centre

(CASTLE QUAY)

Therapeutic Ultrasound

Therapeutic Ultrasound has been a part of clinical practice since sometime back in the 1950's, and remains a popular and evidenced intervention for a range of clinical problems

Ultrasound (US) is a form of **MECHANICAL** energy that is used for various therapeutic interventions. Mechanical vibration at increasing frequencies is known as sound energy. The normal human sound range is from 16Hz to something approaching 15-20,000 Hz (in children and young adults). Beyond this upper limit, the mechanical vibration is known as **ULTRASOUND**. The frequencies used in therapy are typically between 1.0 and 3.0 MHz (1MHz = 1 million cycles per second).

As the energy within the sound wave is passed to the material, it will cause oscillation of the particles of that material. In addition to heat being generated, the vibrational energy from the ultrasound is transferred to the intended tissues within the body as the sound wave pass through it. It is suggested that the application of US to injured tissues will, amongst other things, speed the rate of healing & enhance the quality of the repair (Watson 2006). The therapeutic effects of US are generally divided into: **Thermal, Non-Thermal** and **Micro-Massage**.

Thermal

In thermal mode, US creates an increased temperature in intended tissues. Among the more effectively heated tissues are periosteum, collagenous tissues (ligament, tendon, fascia & fibrotic muscle). When this temperature reaches about 40-45°C, then hyperaemia (increased blood flow) will result, the effect of which will be therapeutic.

Non-Thermal

The non-thermal effects of US are now attributed primarily to a combination of Stable Cavitation (formation & growth of gas bubble) and Acoustic Streaming (small scale eddying of fluids).

Micro-Massage

Micro-Massage is a mechanical effect in which the sound wave travelling through the medium is claimed to cause molecules to vibrate, possibly enhancing tissue fluid interchange & affecting tissue mobility.

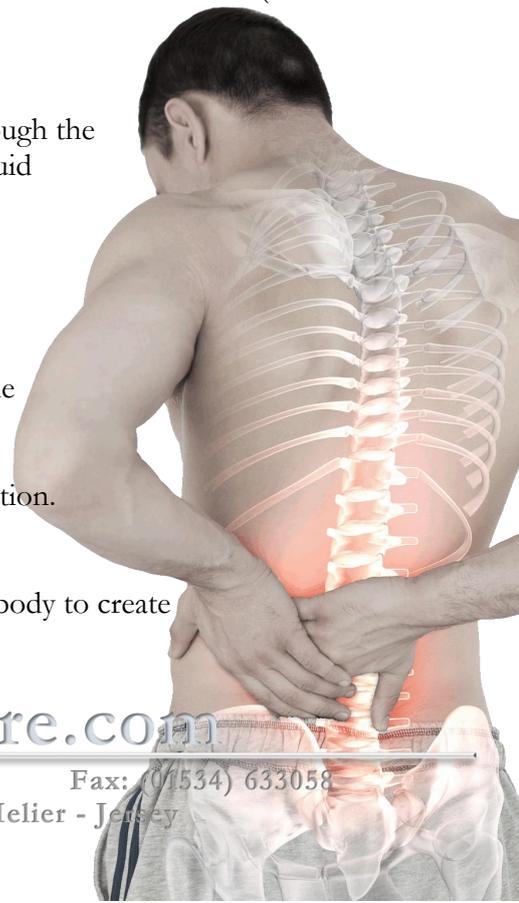
Therapeutic Effects of Ultrasound

Inflammation:

The inflammatory response is essential to the effective repair of tissue, and the more efficiently the process can complete, the more effectively the tissue can progress to the next phase of healing. Using US during this phase of tissue repair can help to optimise the conditions for the body to deal with inflammation.

Scar Production

During the stage of scar production (proliferation) the use of US will aid the body to create better quality scar tissue and breakdown adhesions within the affected tissues.



www.the-wellness-centre.com

Tel: (01534) 633060

the-wellness-centre@hotmail.com

Fax: (01534) 633058

Castle Quay - Millais House - Rue De L'Etai - St. Helier - Jersey

JE2 3WF

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Remodelling

During the remodelling phase of repair, the somewhat generic scar that is produced in the initial stages is refined such that it adopts functional characteristics of the tissue that it is repairing. A scar in a ligament will not 'become' ligament, but will behave *more like* a ligamentous tissue. The application of ultrasound can influence the remodelling of the scar tissue to be capable of enhancing increasing tensile strength and enhancing scar mobility and thereby the functional capacity of the scar tissues.

This information has been supplied by **The Electro Physical Agents and Diagnostic Ultrasound (EPADU)** group.

For more information or to make an appointment please call us on **633060**.



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the-wellness-centre@hotmail.com

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